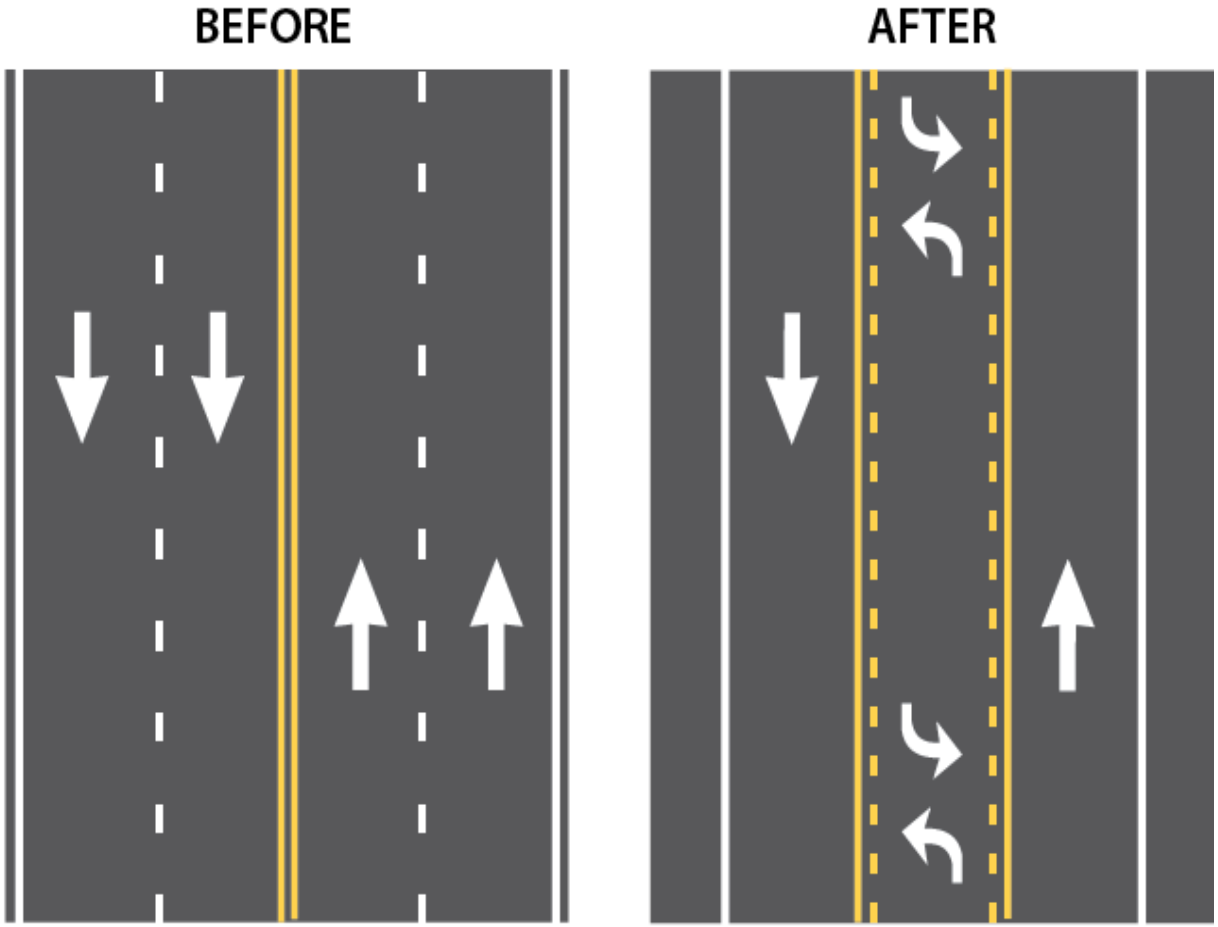

# Road Diets – FHWA Perspective

Mark Doctor

Safety & Design Engineer

FHWA Resource Center – Atlanta, GA

# What is a Typical Road Diet?




Removing or reconfiguring travel lanes and utilizing the space for other uses

# A Typical Road Diet

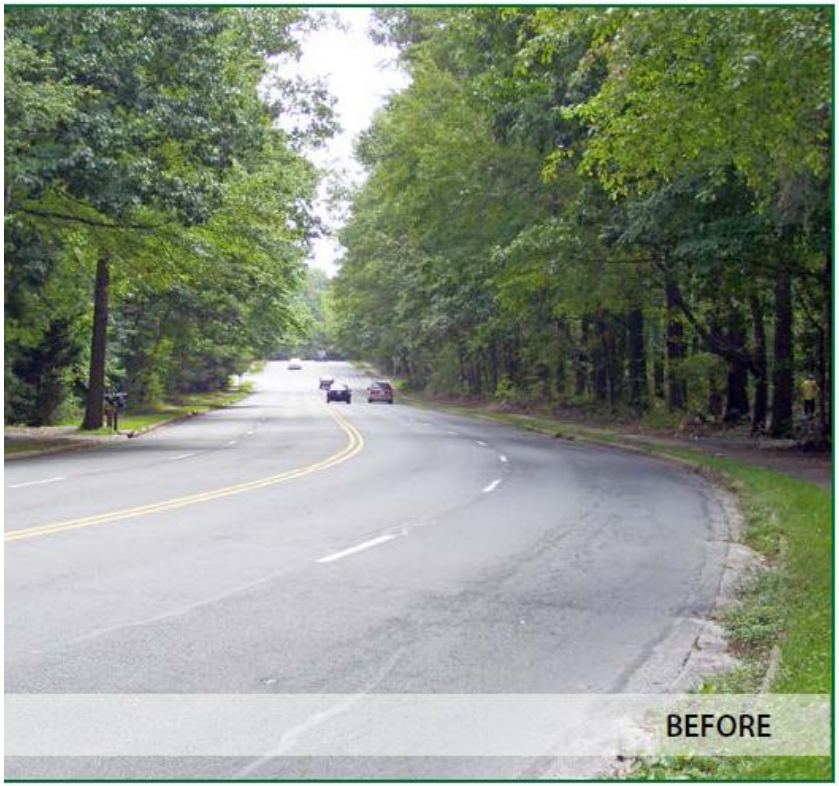


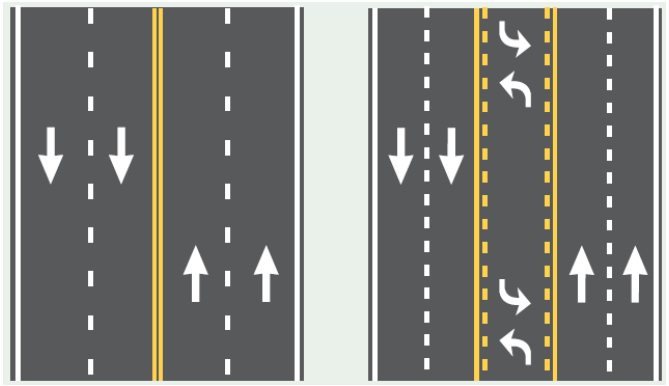


Photo Source: Virginia DOT

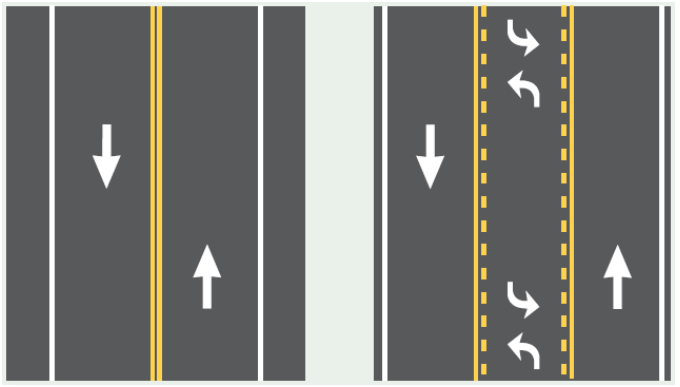
- *Four-lane undivided highways have relatively high crash rates*
- *Inside lanes are shared by higher speed through traffic and left-turning vehicles*

# More Example Reconfigurations

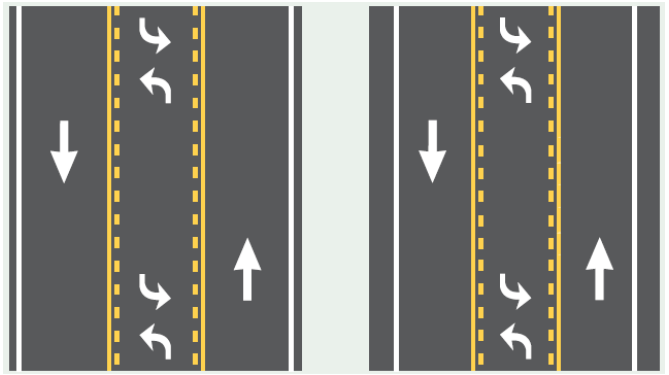
## 4-Lane to 5-Lane



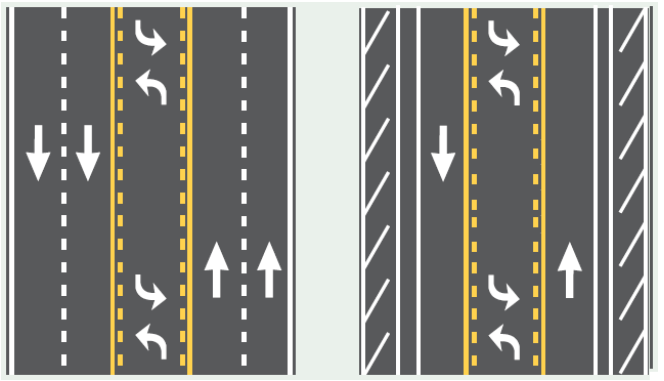
## 2-Lane to 3-Lane



## 3-Lane to 3-Lane

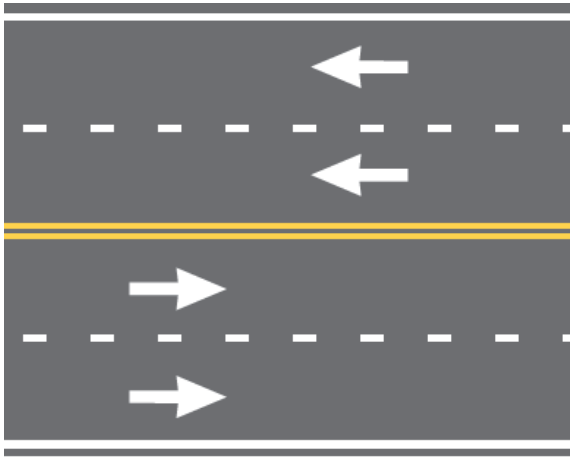


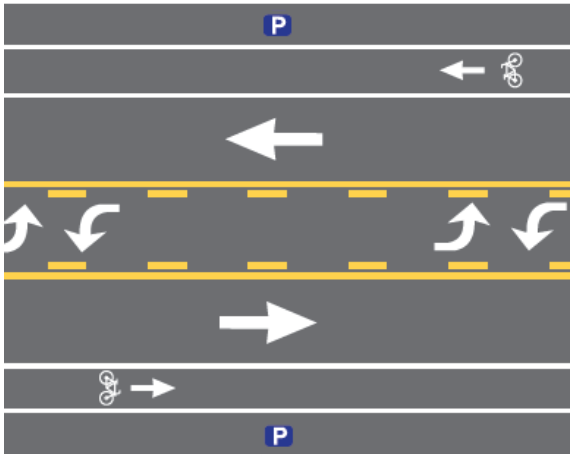
## 5-Lane to 3-Lane



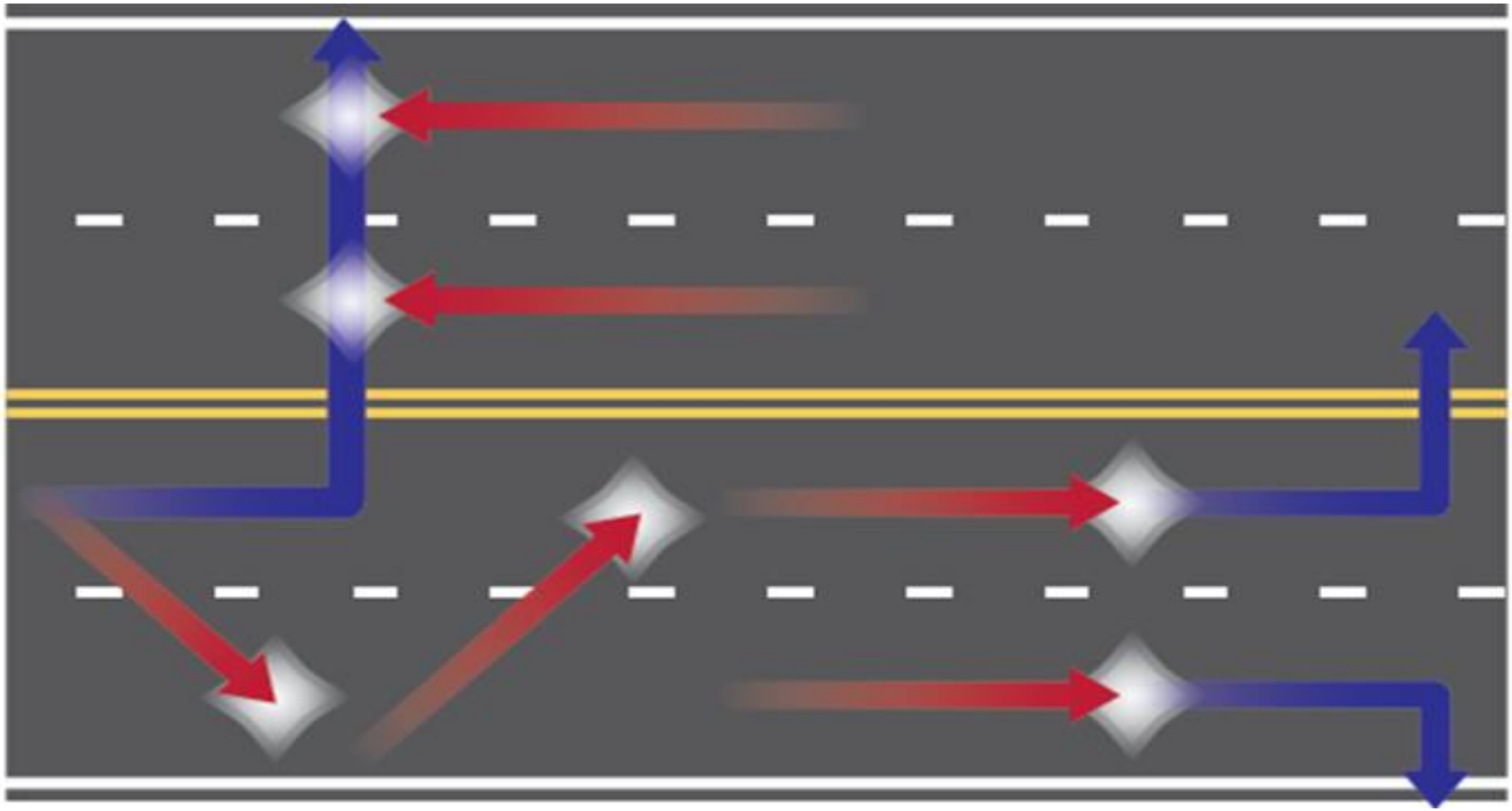
# Common Characteristics

- Utilize existing footprint
- Rebalance / reallocate street space to add features such as:
  - Two-way left-turn lane (TWLTL)
  - Bike Lanes
  - On-street Parking
  - Buffer Zones
  - Landscaping
  - Etc.…



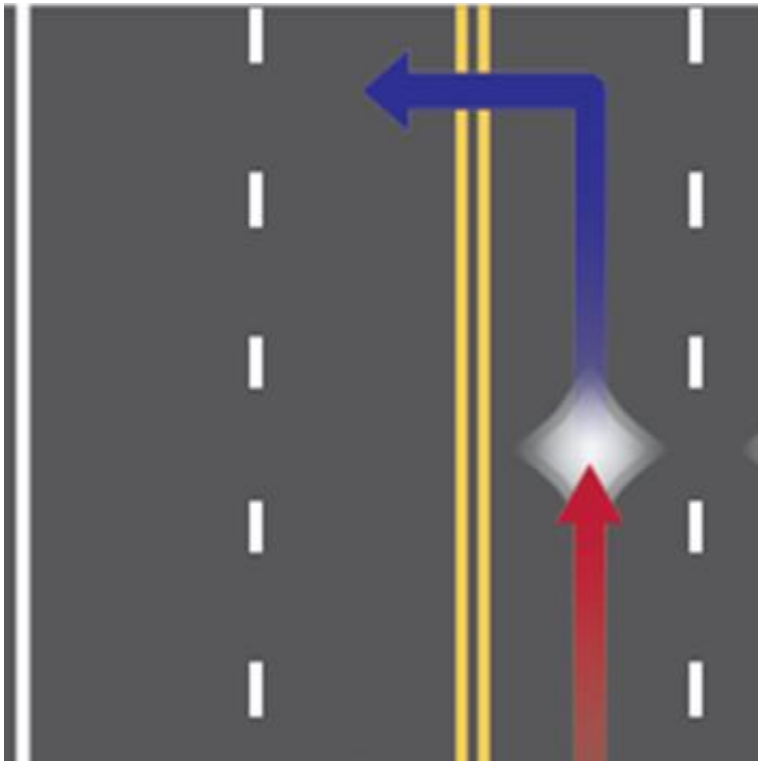



# Why? – To Improve Safety !!!



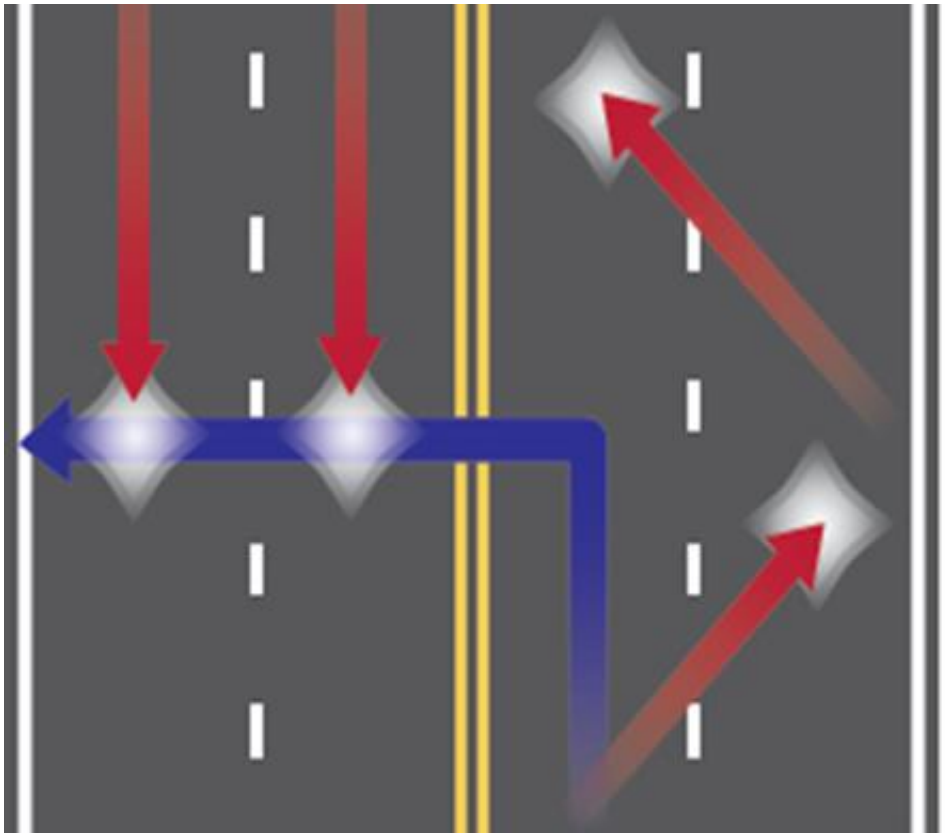
# Safety Concerns on 4-lane Undivided Highways

- Left-turning vehicles stopped in the inside travel lane (Rear-End Collisions)



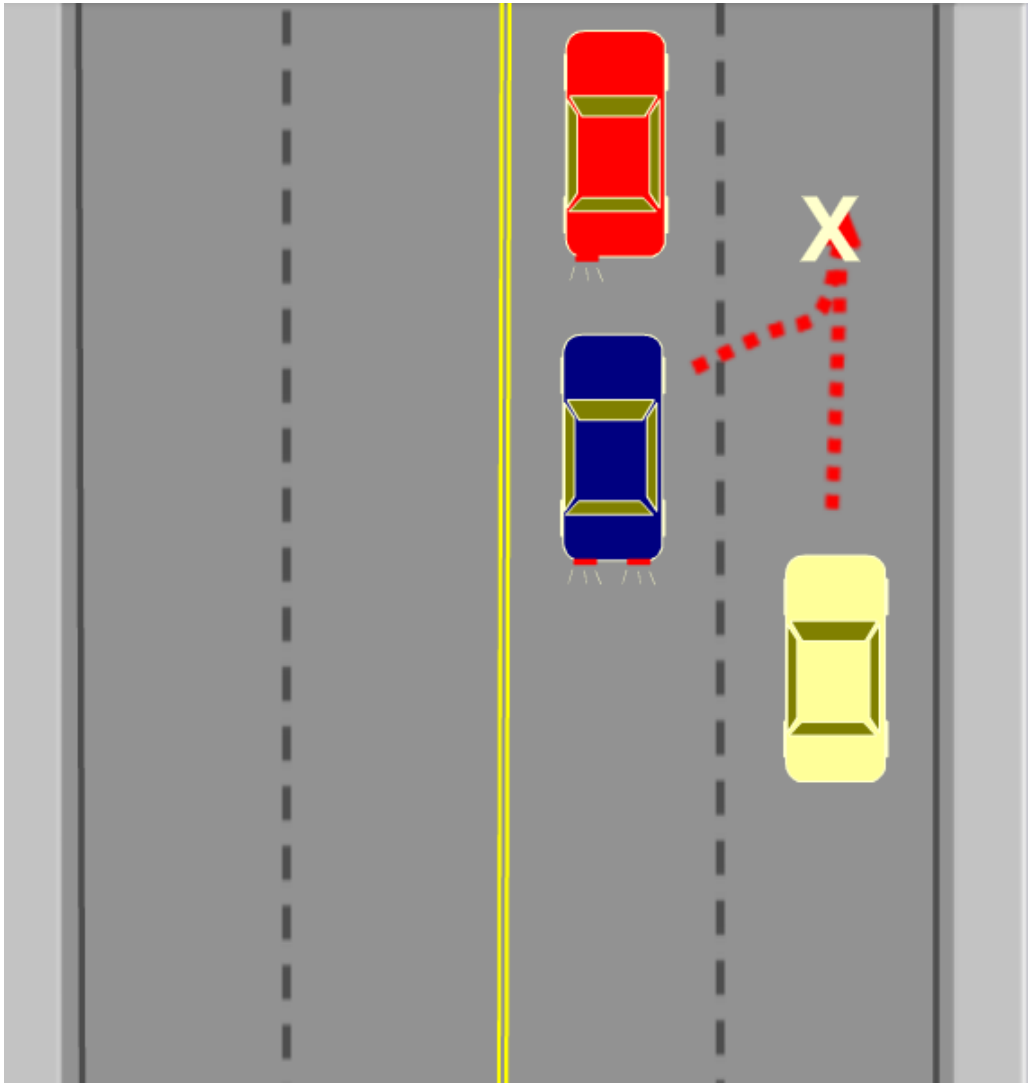
# Safety Concerns on 4-lane Undivided Highways

- Frequent and sudden lane changing between two through lanes (Sideswipe & Rear-End)
- Mainline left-turning motorists making poor gap judgements or feeling pressure to depart the shared through/left lane (Angle)

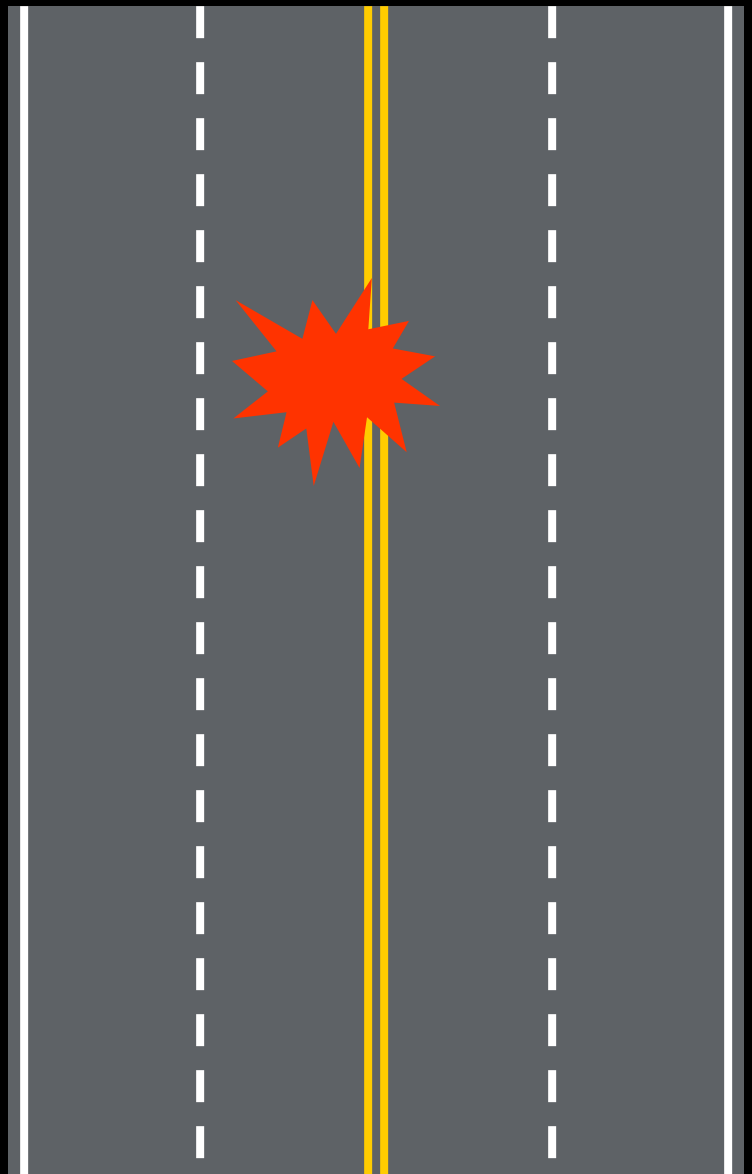


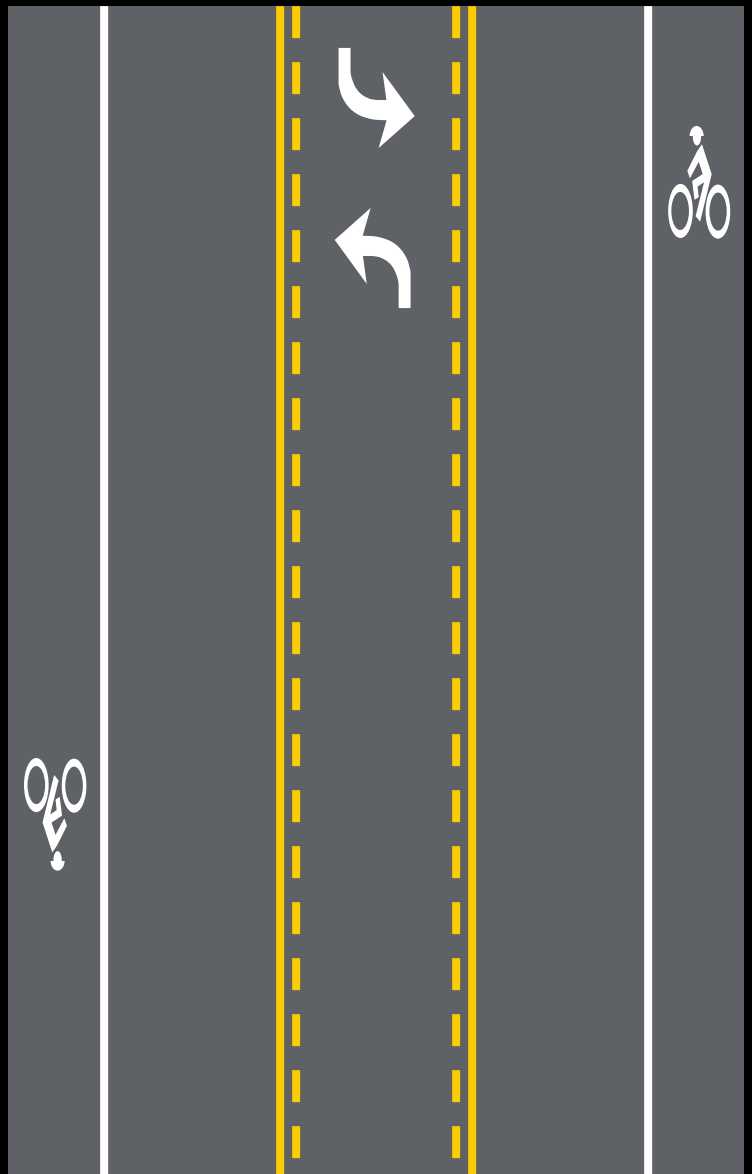
These safety problems become more evident as traffic volumes and turning movements increase

# Side-Swipe Collisions

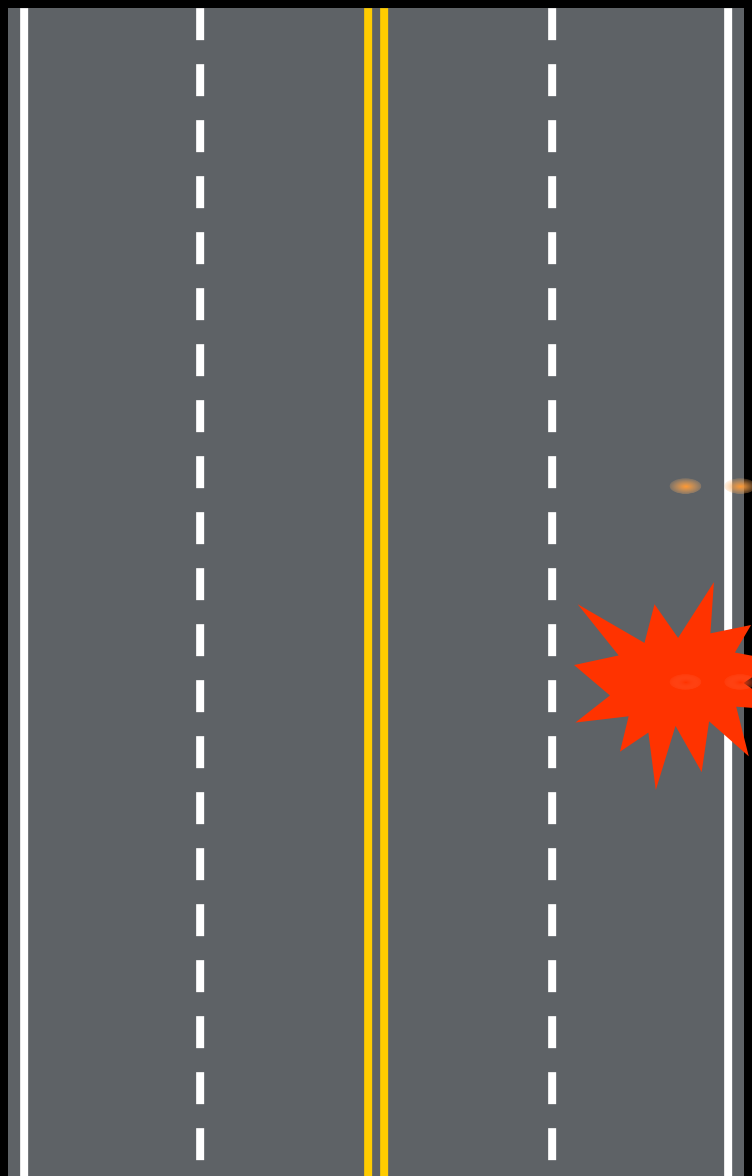


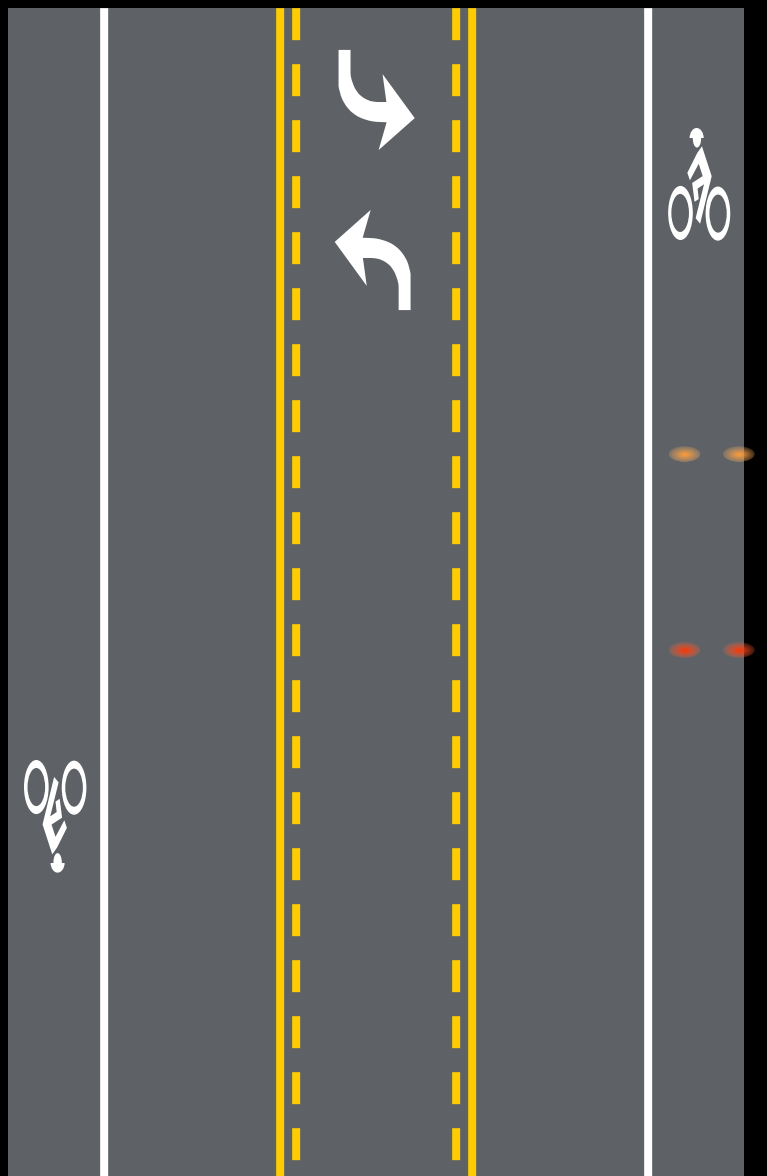
# Increased Separation



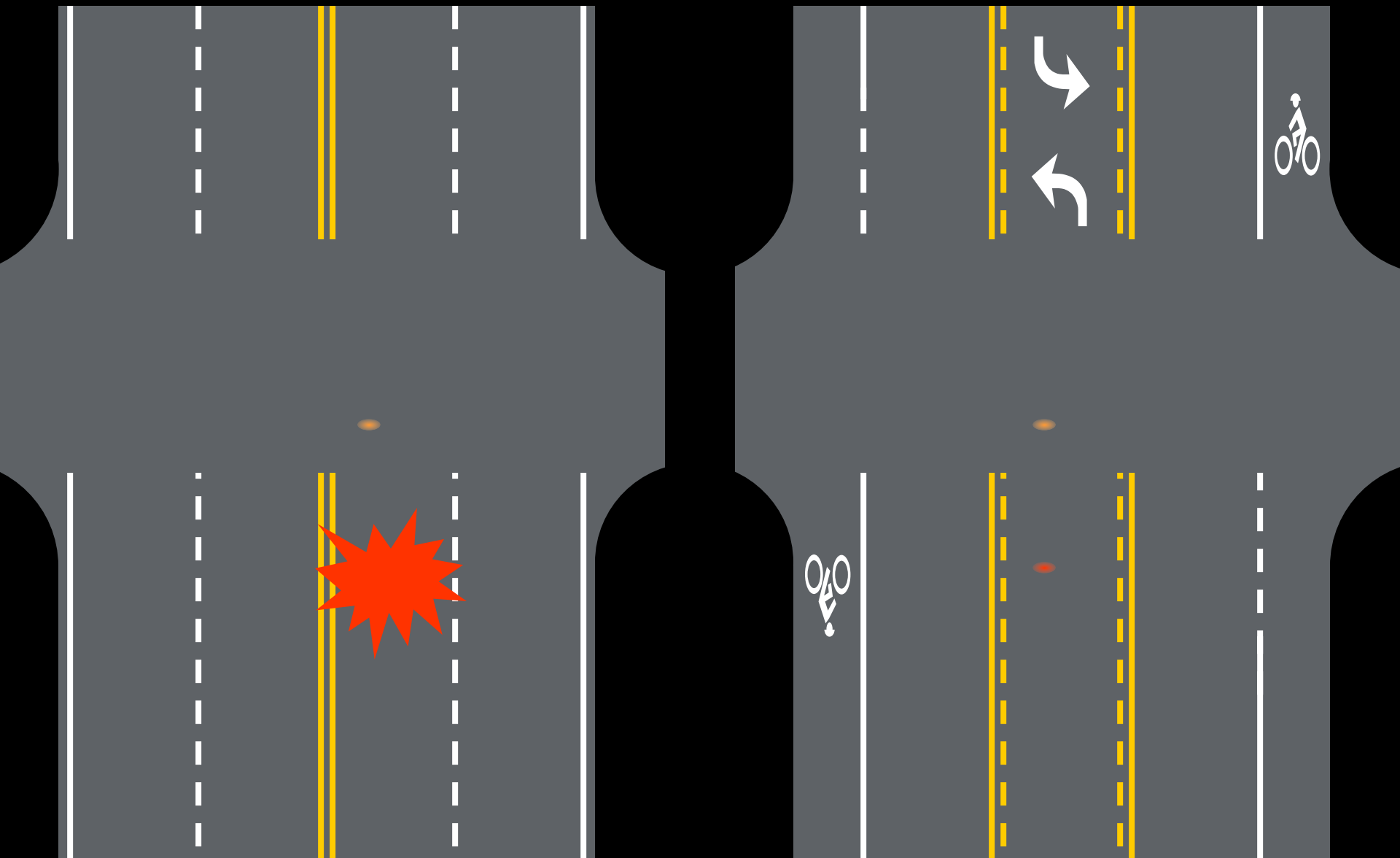


# Stopped or Stalled Vehicle

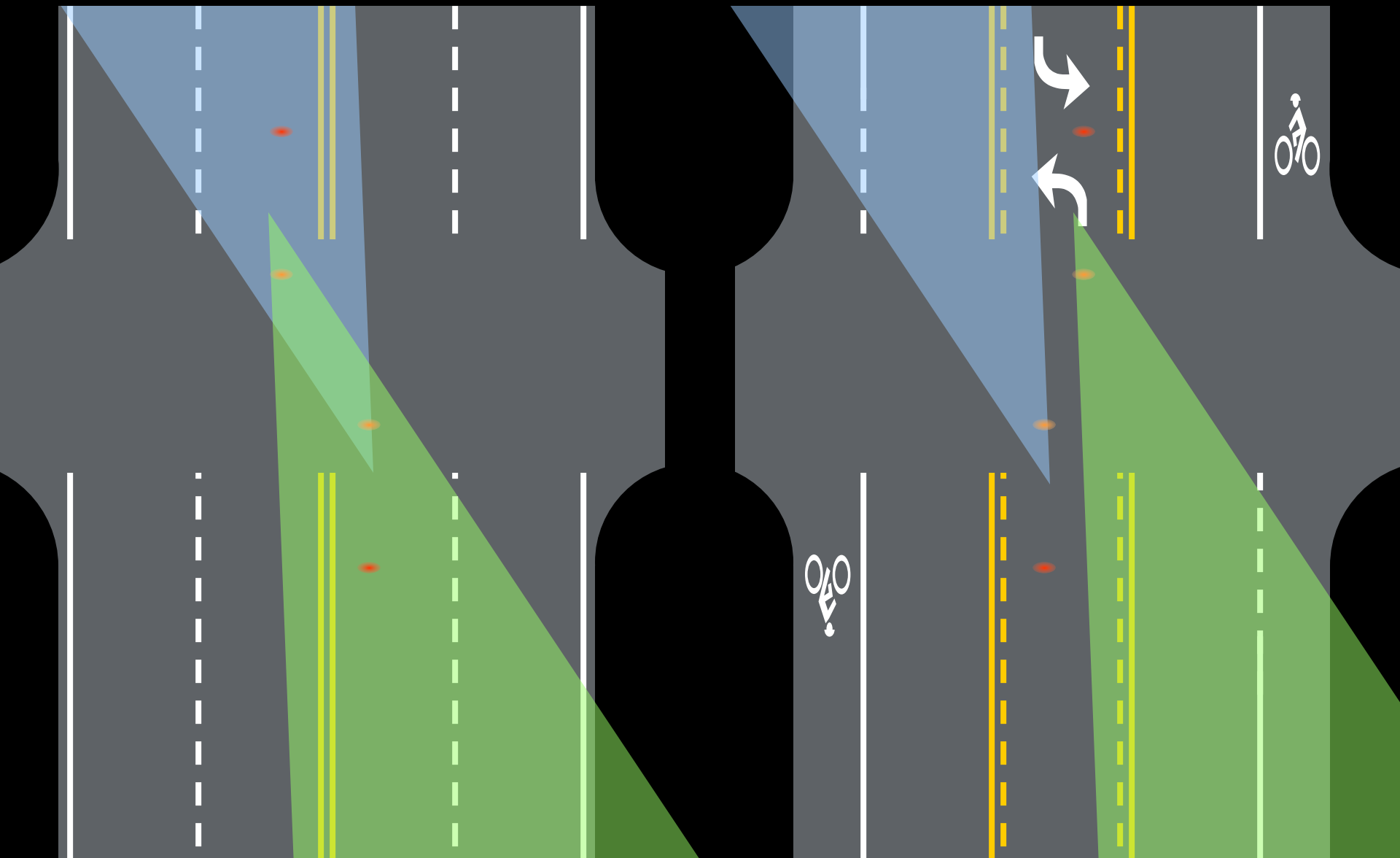




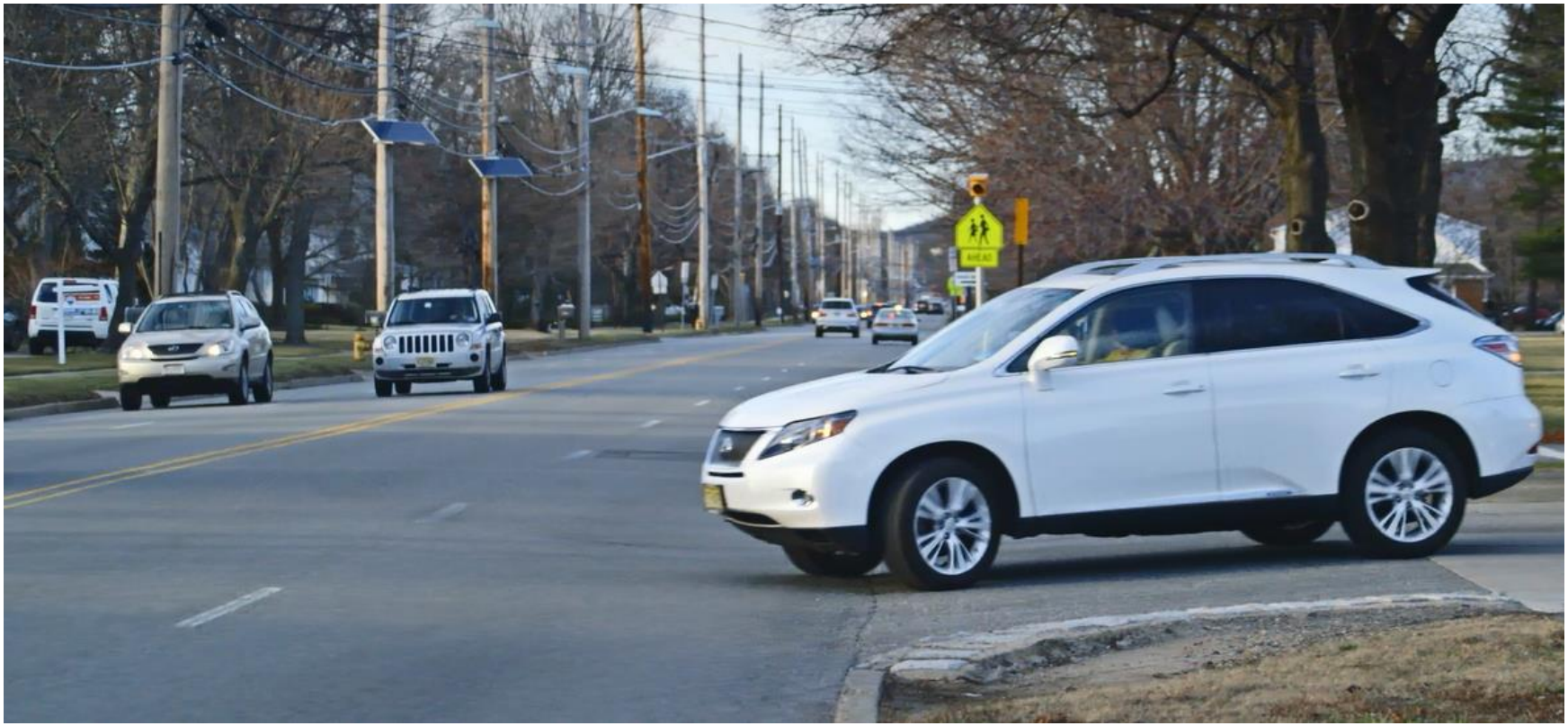
# Dedicated Left Turn Lane



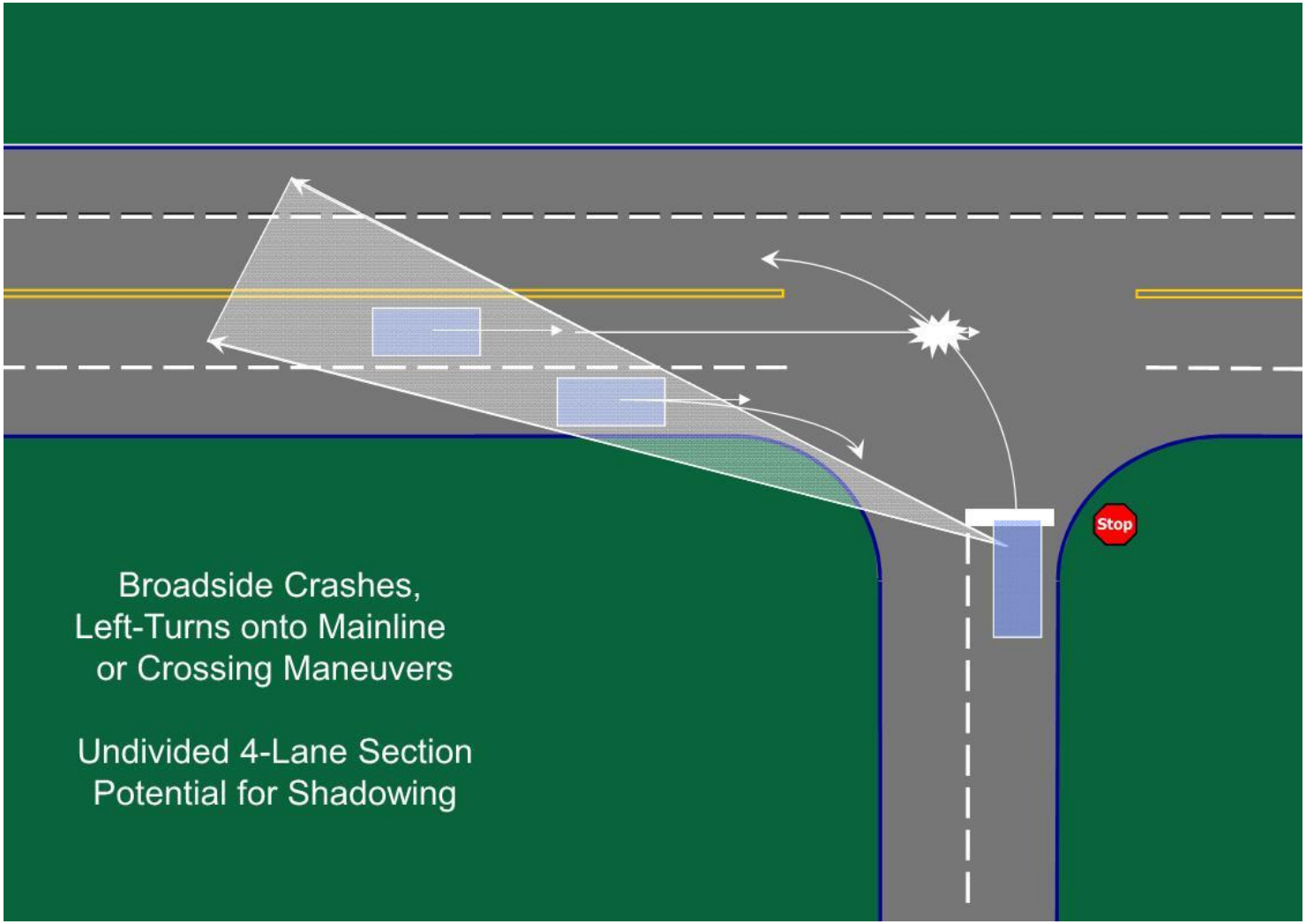
# Sight Lines – Major Road



# Side Street Left-Turn Challenges



# Sight Line – Left Turn from Minor Street



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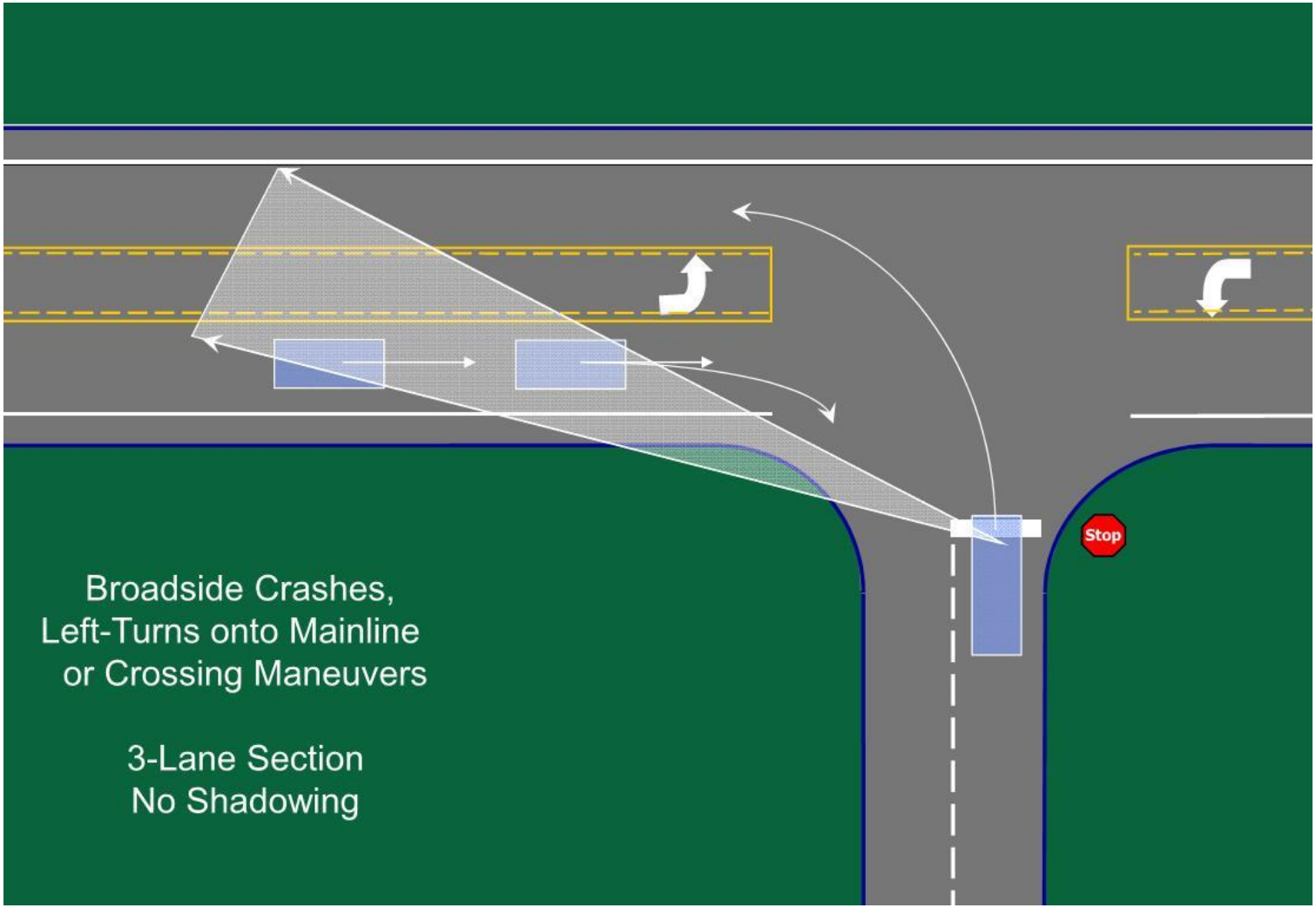
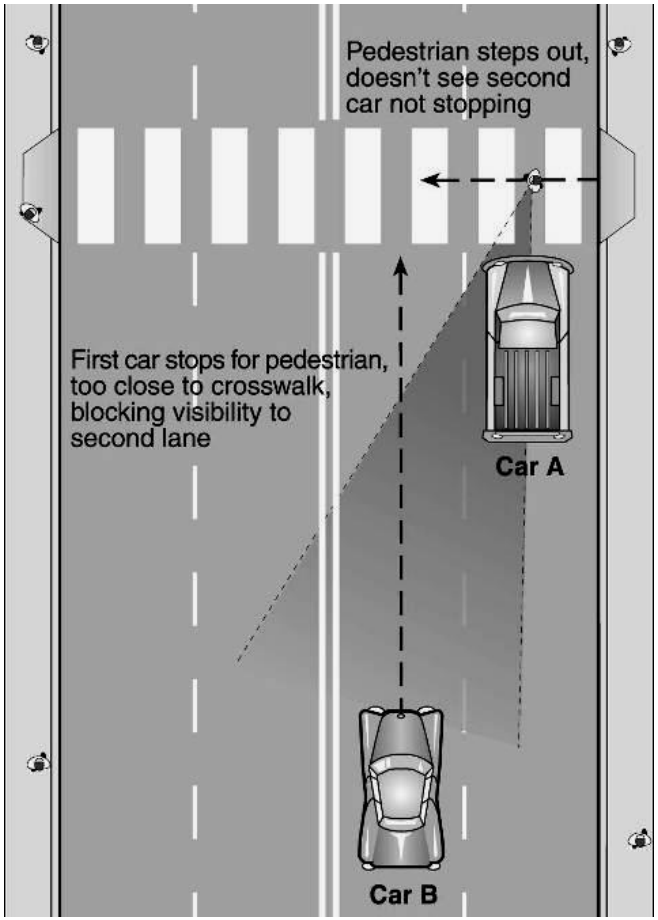


# Improved Sight Lines at Unsignalized Crosswalks

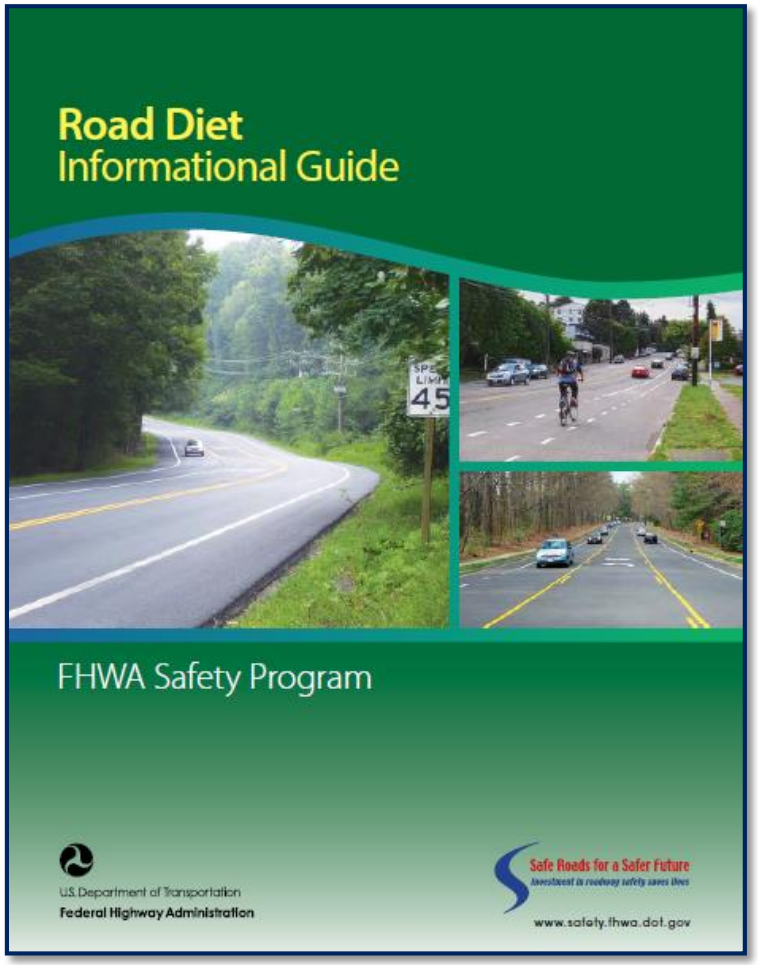


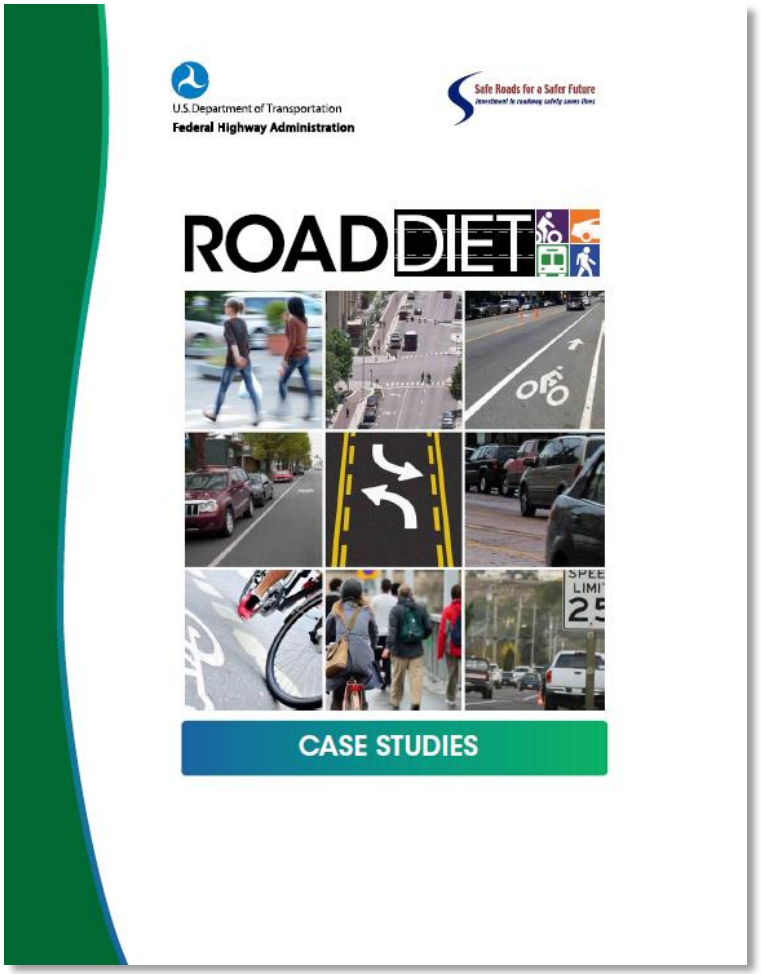

# Safety Benefits

**Based on safety studies, installing a Road Diet has an expected crash reduction of 19-47% ***

* Variables affecting safety effectiveness include pre-installation crash history, installation details, traffic volumes, and the urban or rural nature of the corridor

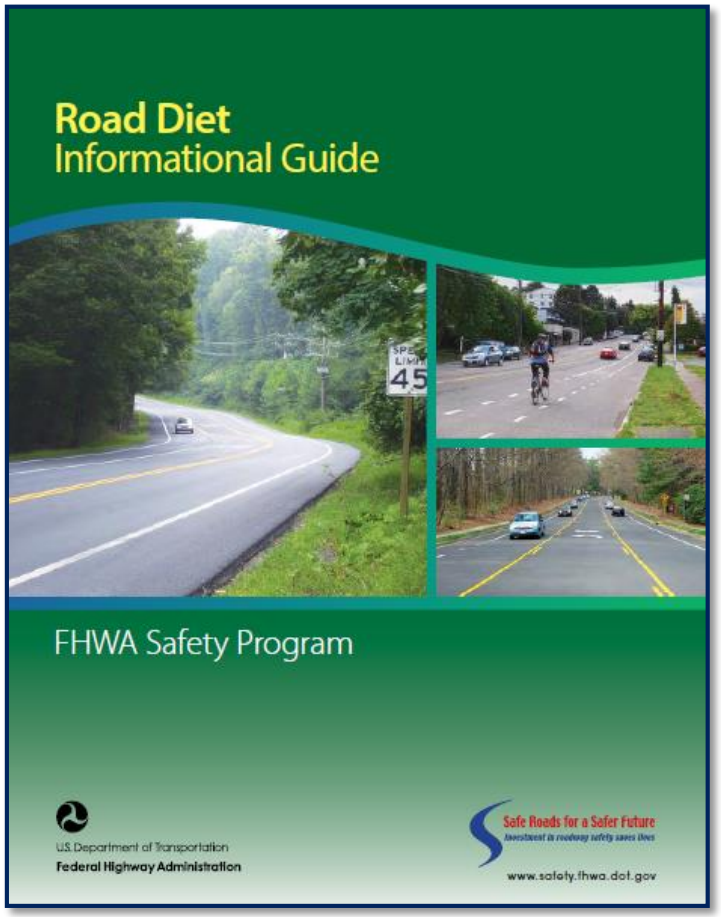
# FHWA Resources




http://safety.fhwa.dot.gov/road_diets/info_guide/

# Road Diet Informational Guide



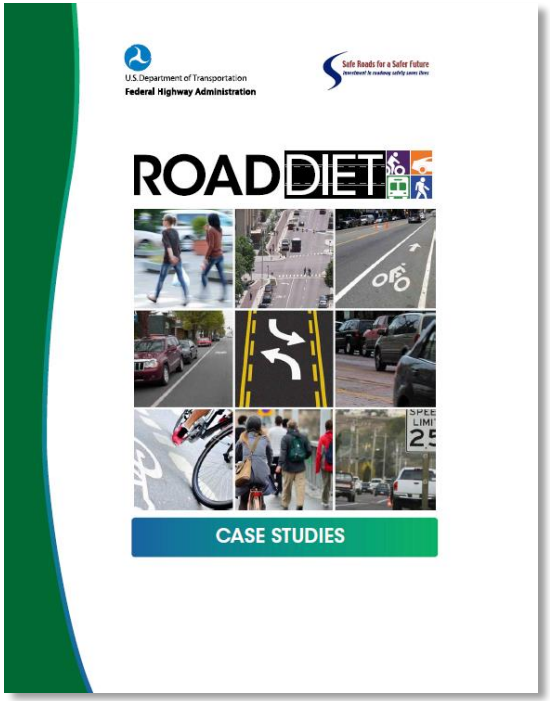

**Chapter 2:** Why consider a Road Diet?

**Chapter 3:** Should a Road Diet be used here?

**Chapter 4:** How do I design a Road Diet?

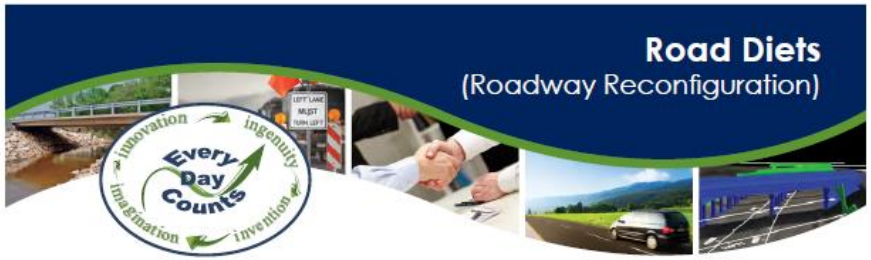
**Chapter 5:** How do I know if the Road Diet is working?

# Road Diet Case Studies Report




| Agency | Location | Title | Key Focus of the Case Study |
|---|---|---|---|
| Genesee County Metropolitan Planning Commission | Genesee County, Michigan | Communities Embrace Widespread Road Diet Use | Assessment and ranking of all 4-lane roads to determine Road Diet potential |
| City of Grand Rapids | Division Street Grand Rapids, Michigan | Livability Improves as Number of Lanes Decreases | Trial-basis Road Diet; highlights the positive outcomes and trade-offs of Road Diets |
| City of Grand Rapids | Burton Street Grand Rapids, Michigan | Road Diet and Transit Working Together | Traffic congestion concerns; transit stops |
| City of Chicago | 55th Street Chicago, Illinois | Road Diet Includes Parking-Protected Bicycle Lanes | Improving bicycle safety and connectivity while maintaining efficient bus operation |
| City of Chicago | Franklin Boulevard Chicago, Illinois | Road Diet Improves Bicycle Connectivity, Enhances Livability | Livability benefits; improving safety and mobility for bicyclists |
| City of Chicago | Wabash Avenue Chicago, Illinois | Capacity Improved After Road Diet | Before-and-after capacity analysis; buffered bicycle lanes; signal optimization |
| City of Pasadena | Cordova Street Pasadena, California | Road Diet Improves Multimodal Level of Service | Improvement in multimodal level of service; addressing speeding issues |
| City of Santa Monica | Ocean Park Boulevard Santa Monica, California | Road Diet Improves Safety Near School | Addressing safety issues near school |
| City of Los Angeles | Seventh Street Los Angeles, California | Road Diet: Key Ingredient in Los Angeles' Bicycle Master Plan | Improving bicycle mobility and encouraging bicycle ridership |
| Virginia Department of Transportation | Lawyers Road Reston, Virginia | All-Around Success for Safety and Operations | Community input and public perception survey; crash reduction; bicycle connectivity |
| Virginia Department of Transportation | Soapstone Drive Reston, Virginia | There's More Than One Way to Complete a Road Diet | Multiple configurations of Road Diets; crash reduction; bicycle connectivity |
| Virginia Department of Transportation | Oak Street Dunn Loring, Virginia | Improving Safety and Livability | Reducing aggressive driving behaviors; providing consistent lane configuration |
| City of Des Moines | Ingersoll Avenue Des Moines, Iowa | Temporary Road Diet Becomes Permanent | Trial-basis Road Diet; public perception survey |
| Regional Transportation Commission of Washoe County | Reno, Nevada | Educating the Public on Road Diets | Public outreach method for education on Road Diet projects |
| Regional Transportation Commission of Washoe County | California Avenue Reno, Nevada | A Feasibility Evaluation Using Traffic Simulation Software | Using traffic simulation software to determine feasibility of a Road Diet |
| Regional Transportation Commission of Washoe County | Wells Avenue Reno, Nevada | Road Diet Improves Safety for Motorized and Non-motorized Users | Evaluating the safety and operational effects of the Road Diet |
| New York City Department of Transportation | Luten Avenue Staten Island, New York | Safety Solution Near School is a Road Diet | Addressing safety issues near school; reducing speeds |
| New York City Department of Transportation | Ninth Avenue Manhattan, New York | Road Diet on One-Way Street Designed for All Users | One-way street; parking-protected bicycle path; bicycle signals; pedestrian refuge islands |
| New York City Department of Transportation | Empire Boulevard Brooklyn, New York | Road Diet Improves Pedestrian Safety | Increasing pedestrian safety; reducing speeds and calming traffic |
| New York City Department of Transportation | West Sixth Street Brooklyn, New York | NYCDOT Responds to Tragedy with Road Diet | Addressing pedestrian safety issues |
| Seattle Department of Transportation | Dexter Avenue Seattle, Washington | Two-Stage Road Diet | 4-lane to 3-lane to 2-lane Road Diet; bus bulb-outs, buffered bicycle lanes; high bicyclist volume and bus ridership |
| Seattle Department of Transportation | Nickerson Street Seattle, Washington | Safety Improved & Extreme Speeding Virtually Eliminated | Reducing speeds; improving overall safety; pedestrian safety features |
| Seattle Department of Transportation | Stone Way Seattle, Washington | Despite Early Opposition, Road Diet Produces Great Results | Public sentiment on Road Diet project; increased bicycle use |
| City of Indianapolis | Indianapolis Cultural Trail Indianapolis, Indiana | Road Diets Lead to Economic Development | Public outreach, planning, and design; economic development success |

# Every Day Counts – Round 3




**Improved safety and congestion relief on public roadways are high-priority national goals. Innovative reconfigurations such as Road Diets can help achieve these goals for motorists and non-motorists on mixed-use streets by reducing vehicle speeds and freeing space for alternative modes. Road diets can reduce collisions, increase mobility and access, and improve a community's quality of life.**

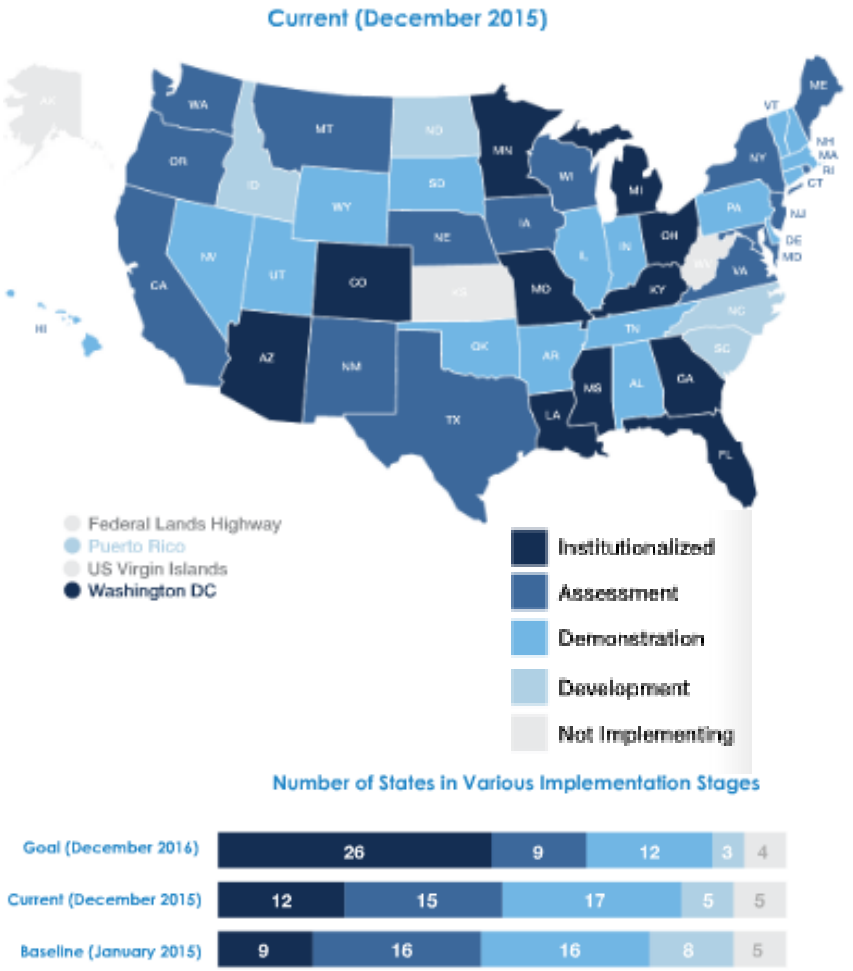
Road Diets are a safety-focused alternative to a four-lane, undivided roadway. The most common type of Road Diet involves converting an existing four-lane, undivided roadway segment that serves both through and turning traffic into a three-lane segment with two through lanes and a center, two-way left-turn lane (TWLTL). The reclaimed space can be allocated for other uses such as bike lanes, pedestrian refuge islands, bus lanes and parking.

On a four-lane undivided road, vehicle speeds can vary between travel lanes, and drivers frequently slow or change lanes due to slower vehicles or vehicles stopped in the left lane waiting to turn left. On three-lane roads with TWLTLs, left-turning vehicles are separated from through vehicles, and the vehicle speed differential is limited by the speed of the lead vehicle in the through lane. This reduces the vehicle-to-vehicle conflicts that contribute to crashes.

A Road Diet applied in Orlando, Florida, converted an existing four-lane undivided roadway segment into a three-lane segment consisting of two through lanes, a center TWLTL, and installed bike lanes. The result was a 34 percent reduction in the total number of crashes, a 30 percent increase in bike volumes, and a 23 percent increase in pedestrian volumes.

A Des Moines, Iowa, Road Diet also provided a benefit to buses: instead of stopping in a through lane and blocking traffic as they had done before

the reconfiguration, the new design accommodated them with a bus turn out. In Pasadena, California, a Road Diet allowed pedestrians to safely cross the road more easily, which provided the unexpected benefit of eliminating the need for a pedestrian traffic signal at the crossing. This resulted in cost savings and eliminated the impact of the signal on traffic flow.

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# ROAD DIET

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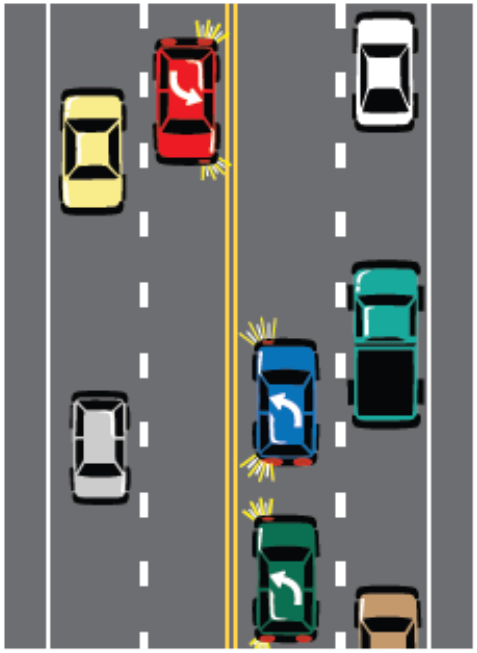
## Myth: Road Diets Make Traffic Worse

**A common misperception is that reducing the number of through lanes by implementing a Road Diet will cause traffic to become more congested.**

**FACT: Under certain conditions, Road Diets may maintain a roadway's "effective capacity" and may even reduce travel times within the corridor.**

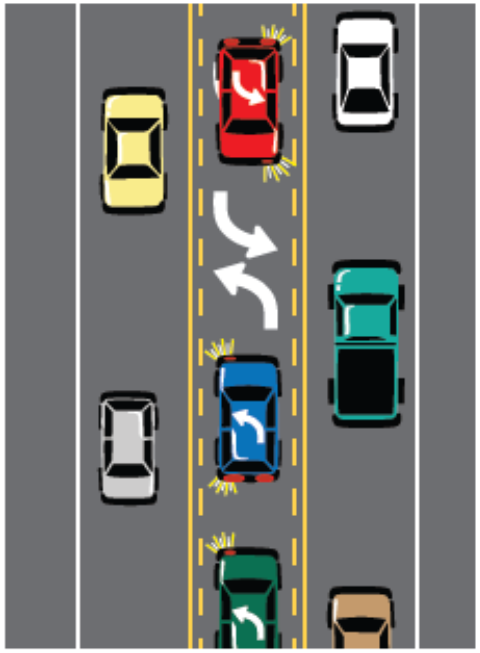
# A four-lane roadway may already operate like a three-lane road.

Some four-lane roads operate essentially like a three-lane road (defacto one lane in each direction) and do not experience a reduction in capacity.



**Before**

A four-lane undivided road operating as a de facto three-lane cross section.

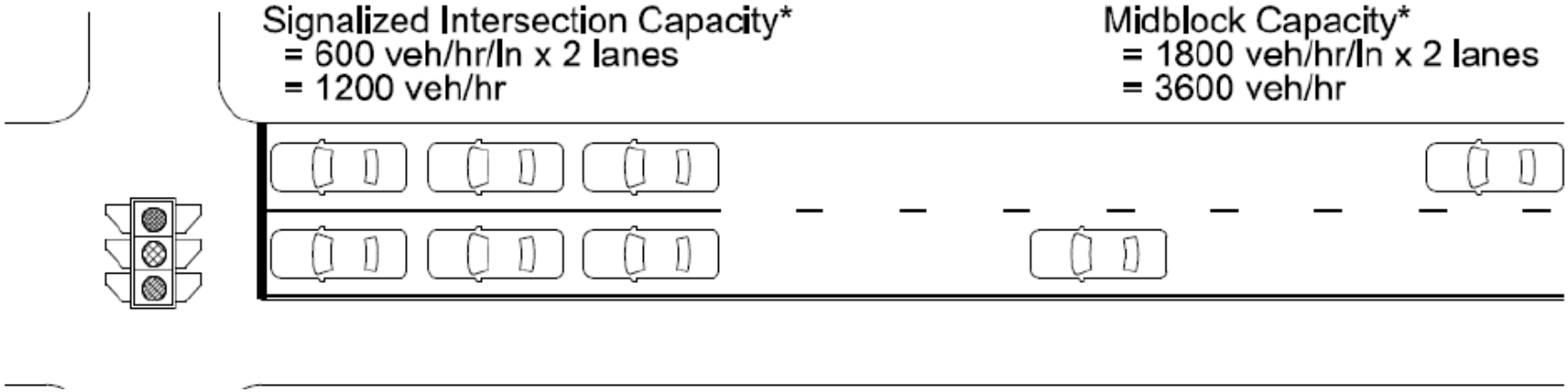


**After**

A Road Diet providing a two-way left-turn lane.

When a corridor contains a large number of access points (driveways) the majority of through traffic will tend to utilize the outside lanes to avoid being delayed by left-turning vehicles slowing and stopping in the inside lanes.

# Intersection Operations



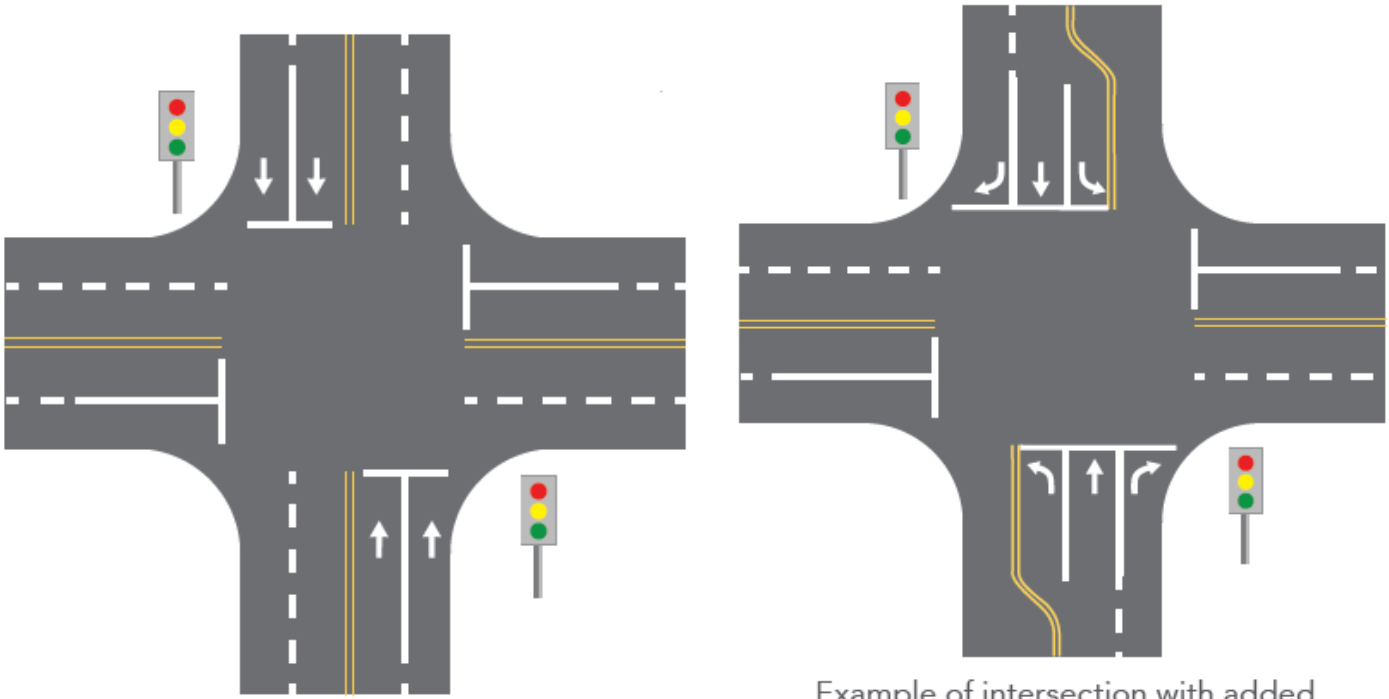

- The "capacity" of a street is determined by the operations at its signalized (or stop-controlled) intersections.

- Capacity "rules of thumb"
  - single mid-block travel lane : 1,800 vehicles per hour
  - single travel lane through a signalized intersection: 600 vehicles per hour (dependent on the time allocated in the signal cycle)

**Unless the street has 3x as many lanes at the intersections as it has mid-block, the intersections will be the limiting factor in terms of capacity.**

# Intersections May Determine True Capacity

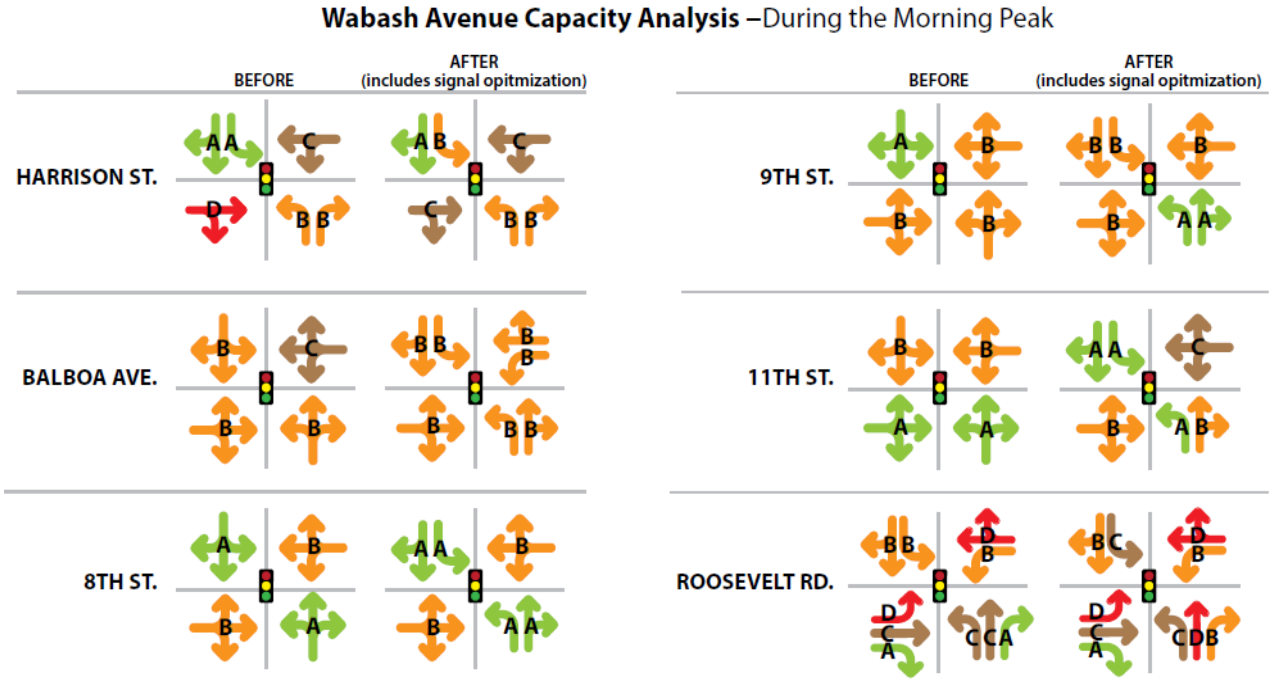
Converting four through lanes to two through lanes may make it possible to install dedicated turn lanes at the intersection



Example of intersection with added turning movements.

# Turn Lane Reconfigurations and Signal Timing Changes

- By carefully analyzing and improving operations at intersections it may be possible to reduce the number of lanes mid-block on a street without increasing delay for motor vehicle traffic.

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# Road Diets and Roundabouts


North Decatur Rd – Decatur, GA

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# LaJolla Blvd – Bird Rock Community (San Diego, CA)

- Prior to 2003, La Jolla Boulevard was a four-lane boulevard moving 20,000 cars per day with average speeds of 38-42 mph.
- The roadway configuration and speed of traffic created a setting uninviting for pedestrians and unable to stimulate growth among local businesses.
- In response to numerous community members demanding a safer walking environment, the City of San Diego, in partnership with the community, embarked upon a project to improve safety along the boulevard.

Source: Arnold, M., Chui, G., and Lupo, D., P.E. "Roundabout Product Demonstration Showcase" Presentation on December 10, 2008, City of San Diego Engineering & Capital Projects Department

# LaJolla Blvd – San Diego, CA

# LaJolla Blvd – Bird Rock Community (San Diego, CA)

- Narrower travel lanes, five roundabouts, landscaped medians and angled parking have slowed traffic speeds, improved pedestrian safety, and also revitalized the businesses!!!

LaJolla Blvd – Photo Credit: Mark Doctor FHWA

# ROAD DIET

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## Myth: Road Diets are only applicable to “low” volume roads.

**FACT: Road Diets can be successful for a broad range of traffic volumes.**

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# General Guidelines for Traffic Volumes

| LESS THAN 10,000 ADT | 10,000 – 15,000 ADT | 15,000 – 20,000 ADT | GREATER THAN 20,000 ADT |
|---|---|---|---|
| **Great candidate for Road Diet** | **Very good candidate for Road Diet** | **Good candidate for Road Diet** | **Potential candidate for Road Diet** |
| In most instances traffic will likely not be negatively affected. | Agencies should conduct intersection analysis to study potential traffic operational effects and consider signal retiming as needed. | Agencies should conduct a corridor analysis since traffic operations may be affected at this volume depending on the "before" condition. | Agencies should complete a feasibility study to determine whether this is a good location for a Road Diet. Operations may be affected at this volume. |

There are several examples across the country where Road Diets have been successful with ADTs as high as 26,000.

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## Myth: Road Diets increase emergency response times.

**FACT: Road Diets can improve emergency response times.**

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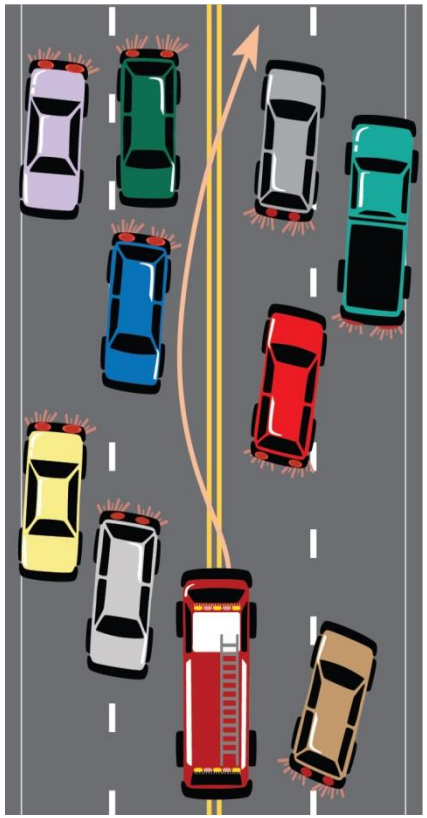
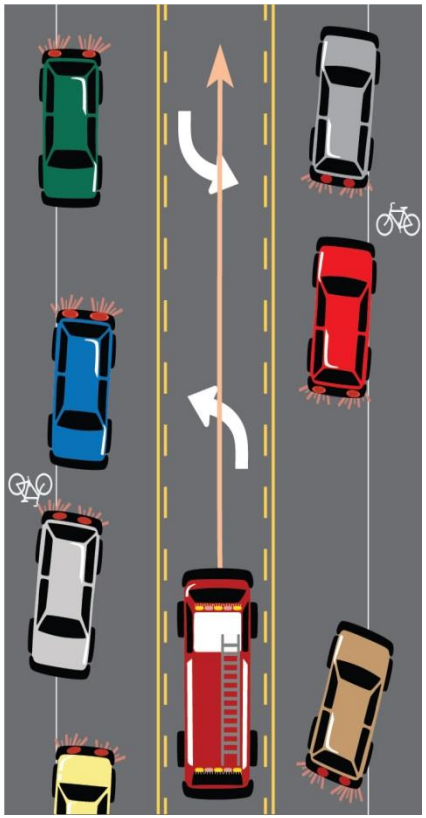
# Emergency Response Vehicles

Before



A fire truck struggling to find a path.

After



An easily navigable two-way left-turn lane.

Four-lane undivided roads can be awkward for emergency responders and can slow response times.

Drivers in inside lanes are often uncertain about where to go to allow emergency responders to pass.

# ROAD DIET

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## Myth: Road Diets don't accommodate large vehicles.

**FACT: Road Diets can often be designed to provide for the needs of larger vehicles including trucks.**

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# Larger Vehicles

Road Diets have been successfully implemented along corridors that accommodate large vehicles like freight trucks and transit buses.

Road Diets may present opportunities to re-plan the roadway space for large vehicles by including delivery parking areas, improved intersection turning radii, and protected bus pull outs for pickup or drop-off.

A Road Diet configured to better accommodate buses.

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## Myth: Road Diets will divert traffic onto other routes.

**FACT: The average daily traffic (ADT) volumes remained the same for most Road Diet implementations.**

# Traffic Volumes Sustained

| Roadway Section | Change | ADT (Before) | (After) | Notes |
|---|---|---|---|---|
| 1. Lake Washington Blvd., Kirkland, Washington South of 83 | 4 lanes to 2 + TWLTL + bike lanes | 23,000 | 25,913 | |
| 2. Lake Washington Blvd, Kirkland, Washington Near downtown | 4 lanes to 2+ TWLTL + bike lanes | 11,000 | 12,610 | |
| 3. Electric Avenue, Lewistown, Pennsylvania | 4 lanes to 2 + TWLTL + bike lanes | 13,000 | 14,500 | |
| 4. Burcham Road, East Lansing, Michigan | 4 lanes to 2 + TWLTL + bike lanes | 11-14,000 | 11-14,000 | |
| 5. Grand River Boulevard, East Lansing, Michigan | 4 lanes to 2 + TWLTL + bike lanes | 23,000 | 23,000 | |
| 6. St. George Street, Toronto, Ontario, Canada | 4 lanes to 2 + bike lanes + wide sidewalks | 15,000 | 15,000 | |
| 7. 120th Avenue, NE Bellevue, Washington | 4 lanes to 2 + TWLTL | 16,900 | 16,900 | |
| 8. Montana (commecial street) Bellevue, Washington | 4 lanes to 2 lanes + TWLTL<br>4 lanes to 2 + median + bike lanes | 18,500 | 18,500 | |
| 9. Main Street Santa Monica, California | 4 lanes to 2 lanes + TWLTL<br>4 lanes to 2 + median + bike lanes | 20,000 | 18,000 | |

# Seattle, Washington – Nickerson Street

## SAFETY IMPROVED & EXTREME SPEEDING VIRTUALLY ELIMINATED

### OBJECTIVE

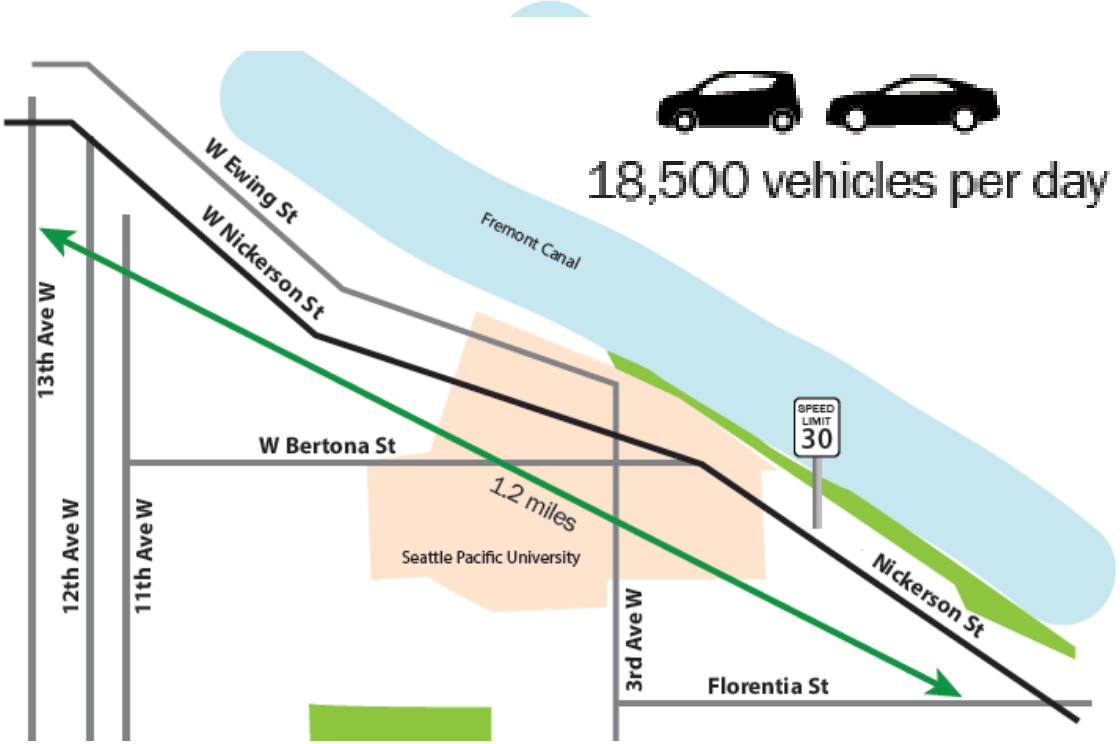
- Improve pedestrian safety
- Increase driver compliance with speed limit

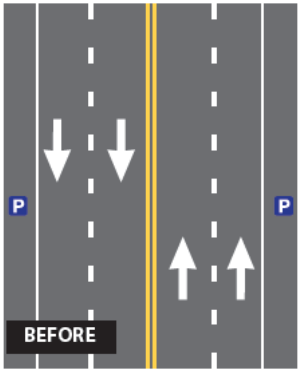
### FEATURES

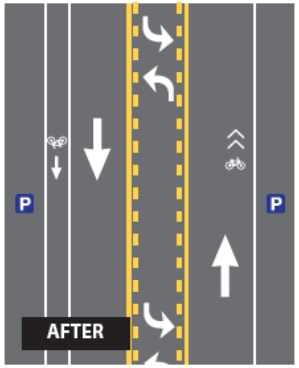
- Reintroduction of crosswalks
- Addition of curb bulb-outs and pedestrian refuge islands

### RESULTS

- 23% reduction in collisions
- More than 90% drop in top-end speeders



# Seattle, Washington – Nickerson Street

## SAFETY IMPROVED & EXTREME SPEEDING VIRTUALLY ELIMINATED


- Speeding decreased dramatically
- Collisions were reduced
- No significant diversion of traffic to parallel routes

TOP END SPEEDERS HAVE BEEN REDUCED BY MORE THAN **90%**

**TOP END SPEEDERS**
*Percent 10+ mph over the speed limit*

| | Before | After | Change |
|---|---|---|---|
| Westbound | 17% | 1.4% | -92% |
| Eastbound | 38% | 1.5% | -96% |

Nickerson Street only experienced a 1% decrease in traffic volumes

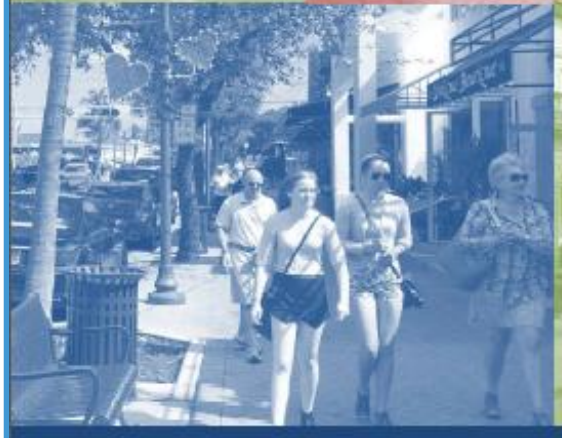
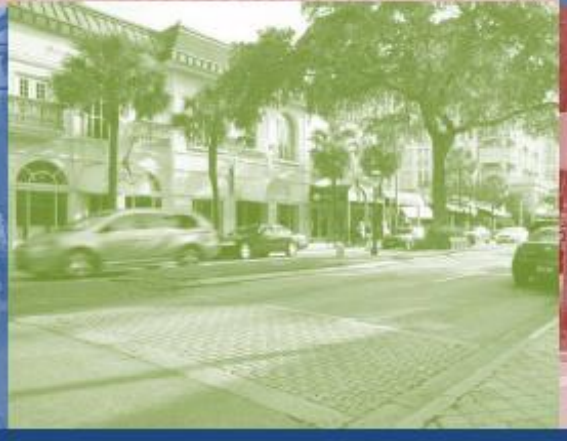
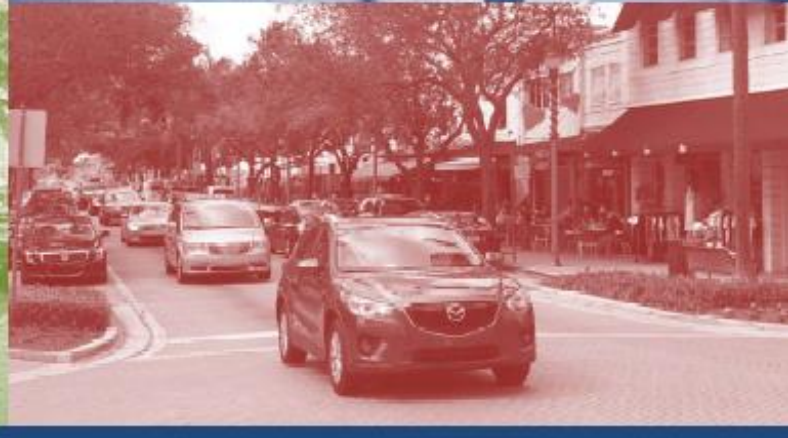
**CHANGE IN NUMBER OF COLLISIONS**
*from 13th Ave W to N Florentia St*

| 5-Year Average | One Year Post Project | Change |
|---|---|---|
| 33.6 | 26 | -23% |

PHASE 1: RESOURCE DOCUMENT

# STATEWIDE LANE ELIMINATION GUIDANCE



**FLORIDA DEPARTMENT OF TRANSPORTATION**
**Transportation Statistics Office**

FEBRUARY 2014

FDOT

# Florida Guidelines

## "Issue Profiles"

| | | |
|---|---|---|
| Safety impacts | Design variances and exceptions | Freight routes/access |
| Traffic operations impacts | Consistency with plans and programs | Extra-jurisdictional impacts |
| Pedestrian and bicyclist activity | Functional classification | Structure/utility impacts |
| Impacts to transit routing/stops and ridership | System designation | Costs and funding sources |
| Impacts on parking supply and activity | Access management | Community support |
| Sales tax revenue and property value impacts | Emergency evacuation and response | Other issues |
| Environmental issues | Jurisdictional transfers | |

**Mark Doctor, PE**

Safety & Design Engineer - FHWA

Atlanta, GA

(404) 562-3732

mark.doctor@dot.gov

2016 Design Training Expo